



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/753,839	01/08/2004	Dennis P. Griffin	DP-308162	6023

7590 04/12/2007
STEFAN V. CHMIELEWSKI
DELPHI TECHNOLOGIES, INC.
Legal Staff Mail Code: CT10C
P.O. Box 9005
Kokomo, IN 46904-9005

EXAMINER

TORRES, JOSE

ART UNIT	PAPER NUMBER
----------	--------------

2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/753,839

Applicant(s)

GRIFFIN ET AL.

Examiner

Jose M. Torres

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a). Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:
 - Page 10 Paragraph [0032] line 8: "lens 504" should be -- lens 524 --
 - Page 11 Paragraph [0035] line 3: "Imaged spots 600" should be -- Imaged Spots 608 --
 - Page 11 Paragraph [0035] line 16: "determined.." should be -- determined. --

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 6, 7, 9, 14, 16, 18, 20 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Wallace et al. (US 6,781,676).

Re claim 1: Wallace et al. disclose an object proximity sensor (FIG. 1, "occupant location system **14**") system for use in a motor vehicle (FIG. 1, "vehicle **10**")

having an occupant area (FIG. 1, "area of interest **44**") defining an air bag deployment zone, and an air bag module (FIG. 1, "air bag module **22**"); said object proximity sensor system comprising: a light transmitter (FIG. 1, "structured light source **40**") capable of emitting light beams that illuminate a predefined area and are capable of reflecting off an object positioned in the predefined area (Col. 3 lines 28-60); a light receiver (FIG. 1, "image sensor **60**") capable of detecting the reflected light beams, said light receiver comprising an image sensor (FIG. 1, "image sensor **60**") capable of acquiring an image of the object in the illuminated predefined area and capable of distinguishing a plurality of imaged spots ('spots of light') in the image (Col. 4 lines 16-30); and a microcontroller (FIG. 1, "controller **34**") coupled to said light receiver and operable to determine diameters ("Width") of the imaged spots and to use the determined diameters to calculate the object's distance from said light transmitter (Col. 5 lines 7-31).

Re claim 2: Wallace et al. disclose an image processor (FIG. 1, "controller **34**") coupled to said image sensor for processing the image, said image processor operable with said microcontroller to determine the diameters of the image spots (Col. 4 lines 41-50 and Col. 5 lines 7-31).

Re claim 6: Wallace et al. disclose said light transmitter includes a plurality of light emitters (FIG. 1, "structured light source **40**, and diffuse light source **58**", Col. 3 line 61 through Col. 4 line 15).

Re claim 7: Wallace et al. disclose said plurality of light emitters include infrared light sources ("infrared range", Col. 3 lines 43-49).

Re claim 9: Wallace et al. disclose in a motor vehicle (FIG. 1, "vehicle **10**") having an occupant area (FIG. 1, "area of interest **44**") defining an air bag deployment zone, and an air bag module (FIG. 1, "air bag module **22**"), a method of establishing the distance between a light transmitter (FIG. 1, "structured light source **40**") and a target (FIG. 1, "occupant **20**") positioned in the occupant area, said method comprising the steps of: emitting a plurality of light beams, said light beams illuminating the occupant area and capable of reflecting off the target (Col. 3 lines 28-60); acquiring an image (FIG. 1, "image sensor **60**") of the target in the occupant area, said image including a plurality of imaged spots produced by said reflected light beams, each of said imaged spots having a diameter Col. 4 lines 16-30 and Col. 5 lines 7-31); determining the diameters of each said imaged spots (Col. 5 lines 7-31); and determining the distance of the target from the light transmitter based upon the diameters of said plurality of imaged spots (Col. 5 lines 7-31).

Re claim 14: Wallace et al. disclose a step of determining whether said target is positioned within the air bag deployment zone based on the target's distance ("sensory information") from the light transmitter (Col. 3 lines 20-26).

Re claim 16: Wallace et al. disclose an object proximity sensor (FIG. 1, "occupant location system **14**") for use in a motor vehicle (FIG. 1, "vehicle **10**") having an occupant area (FIG. 1, "area of interest **44**") defining an air bag deployment zone, and an air bag module (FIG. 1, "air bag module **22**"), the object proximity sensor for use in determining the distance between a light transmitter (FIG. 1, "structured light source **40**") and a target (FIG. 1, "occupant **20**") positioned in the occupant area, the object proximity sensor comprising: light detecting means (FIG. 1, "image sensor **60**") for detecting a plurality of light beams emitted by the light transmitter (FIG. 1, "structured light source **40**") and reflected off the target, said light detecting means and the light transmitter adapted to be positioned proximate to the air bag module (FIG. 1, Col. 4 lines 16-30); image capture means (FIG. 1, "image sensor **60**") for capturing an image of the target in the occupant area, said image containing a plurality of imaged spots produced by said reflected light beams (Col. 4 lines 41-59 and Col. 5 lines 7-31); and means for determining diameters of each of said imaged spots and using the diameters to determine the target's distance from the light transmitter (Col. 5 lines 7-31).

Re claim 18: Wallace et al. disclose said image capture means includes a charge-coupled device (Col. 4 lines 16-30).

Art Unit: 2624

Re claim 20: Wallace et al. disclose said means for determining includes a microprocessor (FIG. 1, "controller **34**", Col. 3 lines 1-11).

Re claim 24: Wallace et al. disclose an object proximity sensor system (FIG. 1, "occupant location system **14**") for use in a motor vehicle (FIG. 1, "vehicle **10**") having an occupant area (FIG. 1, "area of interest **44**") defining an air bag deployment zone, the sensor system for determining the distance from an object (FIG. 1, "occupant **20**"), said sensor system comprising: a plurality of light sources (FIG. 1, "structured light source **40** and diffuse light source **58**") for generating a plurality of light beams that illuminate the object positioned in the occupant area Col. 3 line 60 through Col. 4 line 15); imaging optics for imaging the plurality of light beams on a photosensitive device (FIG. 1, "image sensor **60**"), said imaged light beams forming reflected imaged spots on said photosensitive device, said imaged spots each having a diameter Col. 4 lines 16-30 and Col. 5 lines 7-31); an image processor (FIG. 1, "controller **34**") in electrical communication with said imaging optics; and a microcontroller coupled to said imaging optics and said image processor, said microcontroller and said image processor together operable to determine the diameter of said reflected imaged spots, and said microcontroller operable to use the diameters to determine the object's distance (Col. 4 line 41 through Col. 5 line 31).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 4, 12, 13, 22, 23, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Rudeen (US 5,946,670). The teachings of Wallace et al. have been discussed above.

As to claims 3, 12, 22 and 26, Wallace et al. further teaches said object proximity sensor further comprises memory/storage means (FIG. 4, memory 84") coupled to said microcontroller/means for determining (Col. 7 line 66 through Col. 8 line 18).

However, Wallace et al. does not explicitly disclose said memory storing a look-up table containing imaged spot diameter data and object distance data.

Rudeen teaches said memory storing a look-up table ("graph of experimental data") containing imaged spot diameter data and object distance data (FIG. 13, Col. 8 lines 11-23).

Therefore, in view of Rudeen, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al.'s sensor by incorporating the experimental data showing the imaged spot diameter versus the object distance as the stored data in the memory taught by Wallace in order to provide optical performance data of a measuring device employing laser beams as the measure obtaining method (Col. 8 lines 11-23).

As to claims 4, 13, 23 and 27, Wallace et al. further teaches said microcontroller determines the object's/target's distance/selecting the distance from said look-up table ("using the experimental data as taught by Rudeen, in a similar manner as the stored values in the memory **84**") based upon the diameters of the imaged spots (Col. 7 line 66 through Col. 8 line 18).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Rudeen as applied to claim 4 above, and further in view of Wu (US 6,323,487). The teachings of Wallace et al. modified by Rudeen have been discussed above.

As to claim 5, Wallace et al. modified by Rudeen does not explicitly disclose said microcontroller determined whether the object is within the airbag deployment zone based on the object's distance from said light transmitter.

Wu teaches said microcontroller determined whether the object (FIG. 1, "person **10**") is within the airbag deployment zone (FIG. 3, "at-risk zone **80**") based on the object's distance from said light transmitter (FIG. 1, "emitter module **30**", Col. 3 lines 14-31 and Col. 3 lines 60 through Col. 4 line 11).

Therefore, in view of Wu, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Wallace et al. and Rudeen by incorporating the determination of whether the person is within the at-risk zone or outside the at-risk zone based on the person's distance from the emitter module in order

Art Unit: 2624

to automatically determine, without any action required by the driver or passenger, to whether or not suppress or enable the air bag if the passenger is within the at-risk zone or if the passenger is classified to be a rear-facing infant seat (Col. 1 lines 19-39).

7. Claims 8, 10, 11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Takagi et al. (US 7,134,688). The teachings of Wallace et al. have been discussed above.

As to claim 8, 10, 11 and 21, Wallace et al. does not explicitly disclose the steps of and said image processor, coupled to said image capture means, is operable to remove noise from and perform feature extraction on said image.

Takagi et al. teaches the steps of and said image processor (FIG. 1, "image processing unit 5"), coupled to said image capture means (FIG. 1, "image sensor 1") is operable to remove noise ("noise is effectively removed") from and perform feature extraction ("emphasize outlines") on said image ("frame signal", Col. 3 lines 1-12 and Col. 4 lines 32-39).

Therefore, in view of Takagi et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al.'s system by incorporating the method steps of, and the image processing unit, as taught by Takagi et al., to effectively remove the noise and perform an outline emphasizing process in the frame signal in order to achieve a low memory load for image processing, thereby reducing the image processing time period and providing a rapid control of a safety unit such as an air bag (Col. 1 line 50 through Col. 2 line 2).

8. Claims 15 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Wu. The teachings of Wallace et al. have been discussed above.

As to claims 15 and 29, Wallace et al. does not explicitly disclose a step of one of enabling the air bag module if the target is determined to be positioned within the air bag deployment zone and disabling the air bag module if the target is determined not to be in the air bag deployment zone, and determining whether said target is positioned within the air bag deployment zone based on whether a predetermined number of image spots is within a predetermined range.

Wu teaches a step of one of enabling the air bag (FIG. 2, "air bag **60**") module if the target (FIG. 1, "person **10**") is determined to be positioned within the air bag deployment zone (FIG. 3, "at-risk zone **80**") and disabling the air bag module if the target is determined not to be in the air bag deployment zone (Col. 3 lines 20-31 and Col. 3 lines 60 through Col. 4 line 11), and determining whether said target is positioned within the air bag deployment zone ("outside the at-risk zone") based on whether a predetermined number of image spots ("spots produced by the emitter module **30**") is within a predetermined range ("outside the at-risk zone", Col. 3 lines 14-31 and Col. 3 lines 60 through Col. 4 line 11).

Therefore, in view of Wu, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al.'s invention by incorporating the sensing and diagnostic module, as taught by Wu, to cause

Art Unit: 2624

suppression of air bag deployment if the occupant is within the at-risk zone, enabling the air bag if the occupant is in the at-risk zone and determining whether the occupant is within the at-risk zone based on the imaged spots being within this range in order to automatically determine, without any action required by the driver or passenger, to whether or not suppress or enable the air bag if the passenger is within the at-risk zone or if the passenger is classified to be a rear-facing infant seat (Col. 1 lines 19-39).

9. Claims 17 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Gioutsos et al. (US 5,490,069). The teachings of Wallace et al. have been discussed above.

As to claims 17 and 25, Wallace et al. does not explicitly disclose said detecting means/photosensitive device includes a photodiode.

Gioutsos et al. teaches said detecting means/photosensitive device includes a photodiode (FIG. 2, "photodiodes detectors **102** and **104**", Col. 8 lines 26-46).

Therefore, in view of Gioutsos et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al.'s invention by incorporating the photodiodes detectors as the photosensitive detecting means in order to only obtain reflection from an infrared source, which emits light on a wavelength which can be detected by the photodiode, whose intrinsic properties enables this kind of detection.

Art Unit: 2624

10. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Fernandez et al. (US 2002/0057340). The teachings of Wallace et al. have been discussed above.

As to claim 19, Wallace et al. does not explicitly disclose said image capture means includes a complimentary metal oxide semiconductor.

Fernandez et al. teach said image capture means (FIG. 1, "detectors 3") includes a complimentary metal oxide semiconductor (Paragraph [0023]).

Therefore, in view of Fernandez et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al.'s system by incorporating the complimentary metal oxide semiconductor as the image capture means in order to provide a detection system which has a high noise immunity based on the material characteristics.

11. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wallace et al. in view of Tatum et al. (US 6,875,993). The teachings of Wallace et al. have been discussed above.

As to claim 28, Wallace et al. does not explicitly disclose said light sources are arranged in a collimated array.

Tatum et al. teaches said light sources (FIG. 1, "vertical cavity surface emitting laser (VCSEL)") are arranged in a collimated array ("MxN array", Col. 4 lines 22-40).

Therefore, in view of Tatum et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wallace et al.'s system by

Art Unit: 2624

incorporating the collimated light source array of Tatum et al. in order to electrically connect or couple the emitting elements in virtually any manner desired, and emit the light signal in a single or multiple spatial modes (Col. 4 lines 41-57).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Breed et al. disclose a Vehicular Component Control Systems and Method, Spies disclose an Arrangement for Detecting the Occupancy of a Seat in Vehicles and the Like, and Kraft disclose an Occupant Protection System.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose M. Torres whose telephone number is 571-270-1356. The examiner can normally be reached on Monday thru Friday: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571-272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

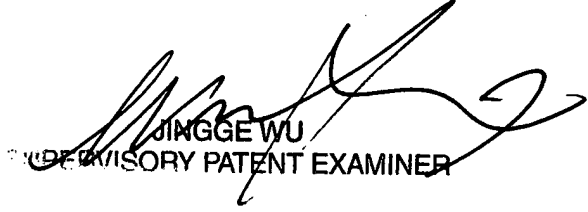
Application/Control Number: 10/753,839

Page 14

Art Unit: 2624

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMT
04/03/2007


JINGGE WU
SENIOR ADVISORY PATENT EXAMINER